

## CLAIMS

I/WE CLAIM:

1. A composition comprising a purified mixture of a bone morphogenetic protein (BMP) selected from BMP-4, BMP-6, BMP-7 and BMP-12, and a fibroblast growth factor (FGF) selected from FGF-1, FGF-2, FGF-4, FGF-5, FGF-6, FGF-8 and FGF-9.
2. The composition of Claim 1, wherein the ratio of bone morphogenetic protein and fibroblast growth factor is a 1:1 molar ratio.
3. The composition of Claim 1, wherein the composition additionally comprises a matrix material.
4. The composition of Claim 3, wherein the matrix material is collagen.
5. The composition of Claim 1, wherein the BMP is BMP-4, and the FGF is FGF-2 or FGF-4.
6. A composition comprising a purified mixture of a bone morphogenetic protein-2 (BMP-2) and a fibroblast growth factor (FGF) selected from FGF-1, FGF-2, FGF-5, FGF-6, FGF-8 and FGF-9.
7. The composition of Claim 6, wherein the ratio of bone morphogenetic protein and fibroblast growth factor is a 1:1 molar ratio.
8. The composition of Claim 6, wherein the composition additionally comprises a matrix material.
9. The composition of Claim 8, wherein the matrix material is collagen.

10. The composition of Claim 6, wherein the FGF is FGF-2.

11. A method for inducing cardiogenesis in cells of non-cardiac lineage, comprising the steps of:

exposing the cells to a purified mixture of a bone morphogenetic protein (BMP) selected from BMP-2, BMP-4, BMP-6, BMP-7 and BMP-12, and a fibroblast growth factor (FGF) selected from FGF-1, FGF-2, FGF-4, FGF-5, FGF-6, FGF-8 and FGF-9; and

observing the development of rhythmic and synchronously contractile cells.

12. The method of Claim 11, further comprising the step of:

confirming the development of rhythmic and synchronously contractile cells by measuring the expression of sarcomeric  $\alpha$ -actin in the cells.

13. The method of Claim 11, wherein both the bone morphogenetic protein and the fibroblast growth factor have a concentration from about 5 ng/ml to about 1,000 ng/ml.

14. The method of Claim 11, wherein both the bone morphogenetic protein and the fibroblast growth factor have a concentration of about 50 ng/ml.

15. The method of Claim 11, wherein the exposure to mixture of bone morphogenetic protein and fibroblast growth factor is achieved by exogenously applying a mixture of the proteins to the cells.

16. The method of Claim 11, wherein the exposure is achieved by transforming the cells with a genetic construct encoding bone morphogenetic protein and fibroblast growth factor.

17. The method of Claim 11, wherein the exposure is *in vivo*.

18. The method of Claim 11, wherein the exposure is *in vitro*.

19. The method of Claim 11, wherein the BMP is BMP-2 or BMP-4, and the FGF is FGF-2 or FGF-4.

20. A method for inducing cardiogenesis in cells of non-cardiac lineage, comprising the steps of:

exposing the cells to a purified mixture of a bone morphogenetic protein (BMP) selected from BMP-2, BMP-4, BMP-6, BMP-7 and BMP-12, and a fibroblast growth factor (FGF) selected from FGF-1, FGF-2, FGF-4, FGF-5, FGF-6, FGF-8 and FGF-9; and

measuring the expression of SRF and Nkx-2.5 in the cells.

21. A method for inducing cardiogenesis in cells of non-cardiac lineage, comprising the steps of:

exposing the cells to a purified mixture of a bone morphogenetic protein (BMP) selected from BMP-2, BMP-4, BMP-6, BMP-7 and BMP-12, and a fibroblast growth factor (FGF) selected from FGF-1, FGF-2, FGF-4, FGF-5, FGF-6, FGF-8 and FGF-9; and

continuing to expose the cells to the BMP without the FGF.